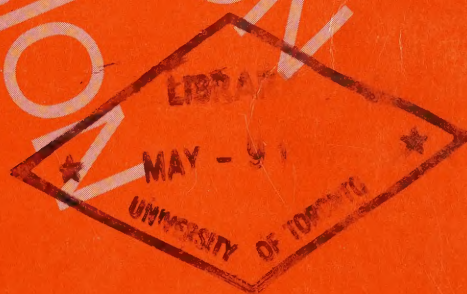


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# TELECOMMISSION



Study 7(d)

## The Relationship Between Department of Communications and the Telecommunications Manufacturing Industry

*The Department of Communications*





Canada Dept of Communications  
Telecommunication studies  
7 (d) CAI CØ 15-715070

STUDY

7 (d)

The Relationship Between  
the Department of Communications  
and the Telecommunications  
Manufacturing Industry

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This Report was prepared for the Department of Communications by a project team made up of representatives from various organizations and does not necessarily represent the views of the Department or of the federal Government, and no commitment for future action should be inferred from the recommendations of the participants.

This Report is to be considered as a background working paper and no effort has been made to edit it for uniformity of terminology with other studies.



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## Terms of Reference

1. To consider, review, analyze and report upon a range of major issues, subjects and other matters necessitating working relationships between the communication-equipment manufacturing industry and DOC.
2. To identify and report upon the importance and implications of the areas included in Item 1.
3. To consider and present conclusions and recommendations concerning the suitability of existing mechanisms for the effective conduct of such working relationships between the two sectors and, where appropriate, to recommend new or revised mechanisms.
4. To consider, report upon, and present recommendations with reference to Items 1, 2 and 3 above where they impinge upon the responsibilities of other appropriate Government departments and agencies such as the Department of Industry, Trade and Commerce; the Canadian Transport Commission; the Canadian Radio-Television Commission; Telesat Corporation; Canadian Overseas Telecommunications Corporation, etc.







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## Part I

Summary of Proposed role of the Department of Communications in its relationship with the Canadian Telecommunications Manufacturing Industry

This study report deals with suggested relationships between the Department of Communications and the Canadian telecommunications manufacturing industry as follows:

The role of the Department would be to provide liaison between the Department and the telecommunications manufacturing industry on matters of establishing performance standards for equipment and systems, participation in international telecommunications bodies, and for liaison with the Communications Research Centre.

Another equally important role of the Department would be to provide effective information flow on telecommunications matters between various sectors of the Canadian telecommunications industry, involving the common carriers, other Government departments (Department of Industry, Trade & Commerce, Department of Energy, Mines and Resources; National Research Council; Department of National Defence; etc.), user agencies, telecommunications consultants, and the Canadian manufacturing industry. This role is proposed, in part, in recognition that the common carriers are the major Canadian purchasers of telecommunications equipment. The Department, in managing the information flow between users and suppliers, particularly as it relates to forward plans, can develop coherent national telecommunications policies.





## Part II

Proposed objectives of Department of Communications to fulfill its role in its relationship with the Canadian Telecommunications Manufacturing Industry

1. To provide for meaningful dialogue between the Department, manufacturers and users, relating to equipment performance standards and measurement procedures.
2. To provide channels for input by industry into such international bodies as CCIR, CCITT and INTELSAT.
3. To provide for discussions between the Department and industry prior to the introduction of regulations which can affect the short and long term development of the Canadian industry.
4. To provide for discussions between the Department and industry concerning ways and means of maintaining and increasing our technological base in the communications industry, university and government laboratories.
5. To provide a basis for exchange of information to optimize the use of national manpower and related resources on existing and future research and development programs in government laboratories, industry and universities.
6. To promote policies of greater Canadian manufacturing participation when possible and feasible, in the supply of commercial telecommunications equipment and systems.
7. To provide for interchange of ideas and information relating to the establishment of national goals involving communications systems and other mission oriented programs.
8. To provide for interchange of ideas and information between commercial user agencies and equipment suppliers and consultants relating to the patterns of growth of Canadian commercial telecommunications systems to serve the public.
9. To encourage the establishment of Canadian manufacturing sources for projected new items of telecommunications apparatus, where such apparatus fits within the national telecommunications technological goals.

10. To encourage common carrier agencies to fully utilize the skills of industry and Canadian consultants in conducting studies and development leading to improvements in telecommunications service.

## Part III

Commentary on achievement of objectives associated with the proposed role of the Department of Communications.

1. Telecommunications Manufacturing Industry Participation in Canadian Radio Technical Planning Board

C RTPB represents most of the Canadian telecommunications manufacturing industry and user interests in Canada (with the exception of the Air Transport Association, Canadian Petroleum Association, Canadian Gas Association and one or two radio common carriers). The C RTPB has been in existence for 25 years and works closely with the Telecommunication Regulation Branch of DOC. The C RTPB is comprised of non-profit associations, societies and organizations representing users and manufacturers of telecommunications and allied equipment. The main telecommunications manufacturing industry is represented by the Electronic Industries Association of Canada and the Canadian Electrical Manufacturers Association. Technical committees and task forces are made up primarily of representatives from member companies of EIAC and representatives of user organizations. While not always possible to obtain consensus of opinion across the entire telecommunications manufacturing industry, recommendations to DOC are accompanied by identified minority opinions. Thus, the overall thinking on subjects relating to radio regulation matters is made available to the Department.

The Canadian telecommunications manufacturing industry considers that the objectives of establishing equipment performance standards are now being satisfactorily performed by the Canadian Radio Technical Planning Board and its interface with the Department.



## 2. Telecommunications Manufacturing Industry Participation in International Bodies

### a) CCIR

Canadian telecommunications manufacturing industry participation in CNO/CCIR (Canadian National Organization) is considered generally satisfactory in assisting the Department to express a common Canadian viewpoint at CCIR international meetings. This participation takes two forms:

(i) Two Canadian manufacturers RCA Victor Co. Ltd. and Northern Electric Co. have joined the ITU/CCIR as a scientific and industrial organization and attend and participate in international meetings. Membership is open to any manufacturer who inscribes to the organizations principles and is willing to pay an annual subscription fee. Application for membership is made directly to the ITU and must be accompanied by an approval of the application by the DOC. The Department has encouraged manufacturers to associate themselves with the ITU/CCIR and has never declined to endorse a company's application. Organizations which are members of ITU/CCIR are automatically members of the CNO/CCIR.

(ii) Canadian manufacturers may also participate through a trade organization such as EIAC, who are members of the ITU/CCIR and also members of CNO/CCIR.

The organization consists of an Executive Committee and Study Groups. Each member has one representative on the Executive Committee which is chaired by DOC. The Executive Committee which is responsible to DOC must approve all documents submitted to CCIR and also position papers. This arrangement which has been in existence for only a few years, allows the views of a wide segment of the total telecommunications manufacturing industry to be considered prior to the formulation

of official Canadian positions and, accordingly, the view of no single sector can predominate.

Any change in this arrangement would severely restrict direct participation by all sectors of the industry. Therefore, the existing arrangement should be affirmed so that the equitable situation now in effect will be assured in the future.

b) CCITT

The only Canadian telecommunications manufacturing industrial participation in CCITT is presently exercised by the Northern Electric Co. Ltd. by virtue of its corporate membership as a scientific and industrial organization. Other scientific and industrial organizations in other countries such as L.M. Ericsson in Sweden and Siemens Halske in Germany are also corporate members. Other Canadian members of the CCITT are the Department of Communications, the Canadian Overseas Telecommunications Corporation, the Railway Association of Canada and the Telephone Association of Canada. The Northern Electric Co. contributes knowledge and expertise concerning the state-of-the-art, current and projected telecommunication technology. Its representatives co-operate with the other agencies in making recommendations for the operation and improvement of the international telephone and telegraph networks.

It is suggested that no administrative changes be made in the present arrangements for handling CCITT matters.

c) INTELSAT

At the present time Canada is represented in the interim Intelsat organization through the Canadian Overseas Telecommunications Corporation (COTC). Up to this point in time, this representation may be considered as having been satisfactory.

However, with the decision by Canada to establish its own domestic satellite

system; the formulation of Telesat Canada with public and private investment, to build, own and operate this system; and the efforts of a number of Canadian organizations dedicated to the export of space systems, it is necessary that a method be found to ensure that a broad spectrum of views of those in the space business be considered in the formulation of official Canadian positions.

It is suggested that an arrangement similar to that in effect for CCIR, through the Executive Committee of CNO/CCIR, be considered for Intelsat.

d) Technical Assistance Provided by the Industry

From time to time the Canadian Government has asked various companies to provide experts as part of the official Canadian delegation at international conferences. At the present time, there is no provision for reimbursement of the expense associated with this assistance, which could mean that Canada would not have the benefit of experts associated with smaller companies in the industry.

To ensure that Canada may have the best representatives available from industry, a method should be found to compensate companies for the expert assistance provided.



### 3. Interface between Department of Communications and the Telecommunications Manufacturing Industry

#### a) Definition of the Interface

In addition to its industry representation through the CRTPB for assistance in establishing equipment performance standards, etc., the manufacturing industry strongly recommends the establishment of interfaces exclusively industrially-oriented.

These interfaces are necessary because the viewpoints of the manufacturers often differ from those of the users since they are based on different factors. Some of these factors are:

- (i) the relationship between cost of equipment and performance standards, and the resulting effect on ability to compete in both domestic and export markets
- (ii) the effect of amortization of equipment on inventories due to obsolescence because of new specification requirements
- (iii) the uncertainty of whether or not the state of the art can be advanced to meet new specification requirements without interim loss of business.
- (iv) the economies and technical resources for provision of equipment for new frequency bands and services.

Obviously, the users view such consideration from the position of an operating agency, in which different sets of economies and logistics are often involved.

#### b) Mechanisms of Interfacing

The industry strongly recommends that the Electronic Industries Association of Canada be considered as the main interface between the Department of

Communications and the telecommunication equipment manufacturing industry.

The Electronic Industries Association of Canada maintains a permanent office and secretariat with facilities for organizing and correlating industry information. Because it is experienced in dealing with competitive companies, it has a system for preserving the security of proprietary information, which is essential for gathering information, statistics, etc., from an industry on a short term basis. Its members respect the confidence of the permanent staff and show no hesitation in providing information as required, provided the collation of such information from the industry will be meaningful and useful. According to the EIAC they are capable of obtaining a wide range of information in a much shorter period than the Dominion Bureau of Statistics.

It is recommended that formal mechanisms for interfacing with EIAC members on research and development and increasing the technology base be established as follows:

- (i) At least once and perhaps twice annually, regular general meetings be arranged between industry representatives and DOC officials responsible for CRC operations for the purpose of outlining CRC technical programs. This would be arranged through EIAC for its members and would be limited to one or two representatives from each interested member company. This kind of forum would provide the opportunity for a question period and some general dialogue covering the necessity or effectiveness of programs.
- (ii) Meetings between the most senior officers of manufacturing companies and senior DOC officials to discuss general program policies on an ad hoc and as-required basis.
- (iii) Technical discussions in depth in which individual companies and CRC

would discuss their R&D projects on a confidential basis. These meetings could take the form of teneral seminars involving 50 or 60 people or could be limited to specific subject areas and smaller groups. They would be arranged on a regular basis with the major companies in the field.

c) Relationship of Communications Research Centre (CRC) with the Industry

The Industry believes the Communications Research Centre (CRC) has an important role to play in future R&D related to the Canadian telecommunications industry. It is important however, to ensure that this role is one appropriate to a government establishment and is not competitive to the manufacturing industry. There are several areas where, because of the nature of the work or a particular capability within CRC not available in industry, CRC should maintain expertise. The industry feels that one of the missions of CRC should be to serve the needs of the Department of Communications and the telecommunications manufacturing industry through the following functions:

- (i) Consideration of communication standards and compatibility between various systems (e.g. propagation characteristics of the atmosphere, techniques for better utilization of the frequency spectrum, etc.).
- (ii) Promotion of technical capability in the Canadian telecommunications manufacturing industry, working in cooperation with other government departments such as Industry, Trade and Commerce, Energy, Mines and Resources, etc.
- (iii) Promotion of research in universities to ensure proper balance of basic research in communications and a reasonable number of people trained in communications.
- (iv) Provision of a forum for the discussion of R&D programs with

universities and industrial groups on matters pertaining to national goals and developments in communications and objectives for future Canadian programs.

- (v) Performance of initial research in high risk areas.
- (vi) Performance of specialized R&D for the industry.
- (vii) Facilitation of the transfer of R&D into the industry at the appropriate point in time.
- (viii) Maintenance of sufficient capability to advise the government on trends in telecommunications and to act as technical advisor to the government.

4. Business Promotion Assistance to the Telecommunications Manufacturing Industry by the Department of Communications

It is well recognized that Canada must do all possible to increase exports, including those from its highly technological industries. Many Canadian companies are investing to the limit of their resources in international marketing expenses. Similarly, the Department of Industry, Trade and Commerce, through its regional and overseas offices, and through incentives, is supporting the export of industry. Further, through the support of Government financing agencies, Canadian firms are generally able to offer attractive terms, which is vital to successful exporting.

It is suggested that the Department of Communications and its agencies, in their various contacts throughout the world, can play an equally important role by providing leads on business opportunities, promoting the excellence of Canadian engineering and Canadian products, and arranging through personal contacts, the introduction of Canadian firms to prospective customers. Conversely, Canadian government employees who downgrade Canadian technical accomplishments can have a most devastating effect upon Canadian exports. Up to this time, both positive and negative effects have been observed and it is hoped that efforts will be made to encourage all agencies of the Department of Communications to "sell" Canadian capability abroad. Similar agencies in countries such as the U.S., Britain, Germany and France, are alert to this need and are most effective in supporting their national industries. Canadian industry needs similar support if it is to succeed in the export market.



5. Management and Promotion of Information Flow between various Sectors of the Canadian Telecommunications Industry

At the present time no effective instrument exists for the management and promotion of an information flow between Canadian industry and consultants and the Canadian telecommunications user agencies such as the common carriers. Such as information flow and exchange is considered necessary as a part of the process to evolve a national telecommunications policy.

The Department of Communications could readily assume the role for management and promotion of this information flow. Such centralized management would be of great and growing assistance to industry to participate more vitally in the expanding Canadian commercial telecommunications service.

Inasmuch as this proposed role is a new one, it would be presumptuous to set forth at this time any specific methods for it to be realized. The Department itself is aware of the considerable need for this role to be fulfilled. Mechanisms must be evolved to bring about the orderly functioning of such a role by the Department. However, to be effective the involvement of top level people from the various sectors of the telecommunications industry is considered essential.

## Appendix I

Background paper prepared by the  
Canadian Radio Technical Planning Board

The 22 sponsor organizations of the C.R.T.P.B. have been vitally concerned for some time that no agreement has been reached with the Department of Communications regarding comments of the Department after the C.R.T.P.B. recommendations have been submitted. The industry believes it would be extremely valuable to formalize an arrangement with the Department whereby the industry would be provided with a summary of the reasons for the rejection of recommendations made by the C.R.T.P.B.

It is recognized that this Study deals with the relationship between D.O.C. and the manufacturing sector of the industry. Since the equipment manufacturing industry is represented by the Electronic Industries Association on the C.R.T.P.B. and forms an extremely important part of the industry, it seems appropriate that a most important interface between the D.O.C. and the manufacturing industry occurs through the C.R.T.P.B.

The request to have the Department consider a formalized reply system would be appreciated not only by manufacturers, but also by the users. This can be accomplished by replying only to the C.R.T.P.B.

J.C.R. Punchard

## Canadian Radio Technical Planning Board

The C.R.T.P.B. was established in 1944 for the purpose of giving advice and making recommendations to the Government concerning the development and regulation of radio services in Canada. Its function is to represent the interests of users, manufacturers and other organizations directly involved with telecommunications in Canada and to develop studies, investigations, recommendations, standards and specifications relating to radio services as may be required.

The 22 members of the Planning Board are called sponsor members who are generally national non-profit associations of commercial companies both operating and manufacturing, technical societies or other bodies concerned with the technical use of radio systems in Canada. The Board consists of representatives of the sponsor organizations, with a President, Immediate Past President, Vice-Presidents, Executive Committee, General Council, Standing and ad hoc Committees and a Secretary-Manager. It maintains an office at 880 Lady Ellen Place, Ottawa, which is open three days each week (Tuesday, Wednesday and Thursday).

The work of the Board is sustained by dues levied on its sponsor members and by a small grant from the Department of Communications. While there are no terms or conditions attached to this grant, except that it be used for Planning Board operations, the Board provides the Department with quarterly income and expense statements, with more complete audited financial reports at its annual meeting. From time to time the Board has originated planning studies, specifications and recommendations for submission to the Department of Transport, but by far the most important part of its work has been confined to review and recommendations on draft specifications and procedures issued by the Department. The procedure for handling such items is as follows:

1. Draft is received at the Board Office and immediately forwarded to main and alternative representatives of all its sponsor organizations.
2. The Draft is also forwarded to the chairman of the appropriate technical committee which is requested to begin the review work and set the schedule for this work to correspond to the effective dates required by the Department. Committees are established by the Executive Committee and consist of knowledgeable persons from the sponsor organizations. In addition, the chairman is empowered to invite to technical committee meetings persons to act in advisory or consulting capacity, but who do not become regular members. Since the Board is highly representative of the entire communications industry in Canada, it has been possible to bring to bear a very high degree of knowledge, experience and expertise in carrying out technical committee work.

3. The committee chairman is responsible for calling the meetings of the committee members. Because of the complexity of technical requirements for equipment bordering on the state of the art, the review work generally requires a minimum of one year and occasionally stretches to longer periods. Between meetings committee members may have to refer technical matters to other engineering groups within their own companies or organizations. In some cases, special laboratory set-ups and measurements are required before satisfactory specification parameters can be specified for recommendation.
4. Committee chairman attempt to obtain unanimous agreement on all technical matters under consideration. Generally speaking, this is seldom possible, in which case both majority and minority opinions and comment are identified and duly recorded. (There is no voting in technical committees). When the work on the draft is completed, the recommendations and comments are forwarded to the Board office. After editing and duplication by the Secretary-Manager, the recommended changes to the draft together with committee comments are forwarded with a voting ballot form to the sponsor representatives.
5. Sponsor organizations may consist of many companies or organizations spread across the country. Many of these, such as the Electronic Industries Associations, have corresponding technical committees who also process the draft specifications and report to the Board committee through their representative to this committee.
6. Sponsors are given 60 days to study, comment and vote on the technical committee's recommendation.
7. Results are collated and recorded by the Secretary-Manager. The recommendations are then forwarded to the Department of Communications together with an identified record of the vote and all comment, both for and against. The record indicates that the Department has accepted about 80 per cent of the changes and suggestions recommended by the Board.

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The Board has not yet found a more democratic or equitable method of determining the wishes of the industry. There appears to be no suitable method of weighing the value, interest or importance of a specification or procedure to a particular sponsor. On the basis of one vote per sponsor, a balloting procedure is purely nominal. The best appraisal which the Board can give to the Department is by the method outlined above, in which any single voice in the industry can be heard, no matter how small.

As a matter of principle, the Board in no way interferes with direct contact between a company, an association or any



other member organization and the Department, when such contacts are deemed to be desirable and more effective than working through the Board.

Experience has shown that users generally tend to press for tighter and tighter specifications in order to guarantee a high degree of performance in their systems. On the other hand, manufacturers tend to press for more relaxed technical requirements in order to keep costs and prices to a minimum and thus increase their opportunities to sell in both domestic and export markets. Foreign owned subsidiary companies often import U.S. or U.K. designs on equipment which will not meet Canadian draft requirements from D.O.C. These companies wish to avoid further expensive engineering development and, therefore, resist tighter limits on performance parameters.

An important difference between U.S. and Canadian regulatory specifications is due to the fact that receivers, as well as transmitters, are regulated in Canada. The majority of companies in the Electronic Industries Association are subsidiaries of foreign companies and often believe that the stringent specifications drafted by D.O.C., particularly those pertaining to receivers, are unrealistic. This causes sharp differences of opinion in the technical task force work, since the final issuing of regulatory specifications has a direct bearing on cost and price of manufactured equipment. The situation is aggravated because users (who generally want tighter specifications) are in the majority in C.R.T.P.B. (by number of Associations). Although the C.R.T.P.B. recommendations are not established on the basis of voting alone, there is a feeling among manufacturing companies (who actually have to develop equipment to meet the specifications) that their opinions are sometimes unjustly outweighed by the opinions of the users.

The interpretation of the Radio Act is also a source of difficulty between the D.O.C. and the industry. Since the Department is responsible for the administration of the Act, it believes it must uphold the highest possible standards of equipment performance in order to ensure satisfactory service to the user. This obviously involves specification of parameters which have no bearing on the regulation of the frequency spectrum (receiver audio response and power output, hum and noise level, sensitivity, selectivity, etc.). Strict adherence to narrow or severe limits on such parameters for receivers causes hardship in the industry, particularly where portable equipment of limited range is involved. The price of such equipment has a very considerable effect on the quantity which can be sold, and overly severe restrictions on receiver operating parameters may preclude the manufacture or sale of such equipment.

It must be emphasized that the C.R.T.P.B. is basically committed in principle to upholding high performance requirements, but it does believe that an essential part of the process of frequency spectrum management involves relaxation of certain requirements for certain services under certain



conditions, depending on frequency, power, location, etc. It agrees in principle that receiver parameters should be regulated, within reason, and that such regulation has upgraded and can upgrade radio service performance in Canada over that experienced in other countries.

The C.R.T.P.B. believes that its work with the D.O.T. (and now D.O.C.) over the years has contributed greatly to the quality of radio communication services in Canada. It believes it is performing an essential function in the interest of both the Department and the industry. It recommends that this work be continued and strengthened.

A list of sponsor members of C.R.T.P.B. is attached.

## Sponsor Members of C.R.T.P.B.

American Radio Relay League (Canadian Division)  
Association of Municipal Electrical Utilities of Ontario  
Canadian Association of Broadcasters  
Canadian Association of Broadcast Consultants  
Canadian Association of Chiefs of Police  
Canadian Broadcasting Corporation  
The Canadian Education Association  
The Canadian Electrical Association  
Canadian Electrical Manufacturers Association  
Canadian Overseas Telecommunication Corporation  
Canadian Trucking Association  
Dominion Marine Association  
Electronic Industries Association of Canada  
Engineering Institute of Canada  
Institute of Electrical and Electronic Engineers  
Canadian Cable Television Association  
Ontario Department of Education  
Ontario Provincial Police  
The Railway Association of Canada  
Royal Canadian Mounted Police  
The Telephone Association of Canada  
Western Canada Telecommunications Council

## Appendix II

Background paper prepared by the EIAC on the Relations between Department of Communications (DOC) and Electronic Industries Association of Canada (EIAC) on Radio Standard Specifications. (R.S. Specifications) and Licensing policies.

At the present time, RSS proposals or proposals for change, are submitted by DOC to the Canadian Radio Technical Planning Board (CRTPB) for comment. The EIAC is a sustaining member of the CRTPB and theoretically the views of its interested member companies are made known through its representative on the Board. Practically, as the subjects generally are technically complex, specialists are required to give expert opinion. The specialist member is brought to bear by having expert subcommittees in each organization with a liaison between the committees. In many cases, considerations other than technical come into play and compromise positions have to be sought.

This existing procedure from DOC, through the CRTPB to Industry, to obtain their reaction, has worked well in the past. However, the ever-increasing requirements for effective Communication Services in Canada, requires prompt action by Government on the adoption and implementation of Standards or changes to Standards. The lengthy channel and consequent processing time, coupled with pressure for urgent action, has recently, on occasion, resulted in Government action without appropriate input from the important industry sector. This lack of comment and advice from an area in which resides one of the highest concentrations of technical expertise in the Communications field in Canada, has resulted in action, which in our opinion has not necessarily been in the best public interest nor in the best interest of the electronics industry.

The CRTPB should continue to exist and should continue to be a mechanism for an effective relationship between DOC, User organisation and the Communications Manufacturing Industry for the following reasons:

1. CRTPB is an effective meeting point between the users of communications systems and the manufacturers of communications equipment and systems.
2. Recommendations of the CRTPB have generally been sound.

However, it is the opinion of the EIAC that its member companies, through it, should also have direct dialogue on technical and other relevant matters with the DOC for the following reasons:

1. A direct dialogue between DOC and EIAC will give DOC an uncluttered viewpoint of the manufacturers of communications equipment and systems.

2. Where users and manufacturers have divergent views, these will be brought into sharper focus, and with less delay will be brought to DOC attention for consideration.
3. EIAC comments and technical advice on DOC proposals will be more promptly available.

Relevant to the above, EIAC has become increasingly concerned with aspects of public policy, which are having serious effect on the growth of the Canadian communications manufacturing industry. By direct dialogue with the Department, the DOC could have been made aware of and requested to give proper consideration to, the serious effects these aspects would have on the manufacturing industry.

These are as follows:

1. Issuance of Radio Standard Specifications for equipment, which force the Canadian manufacturer to supply equipment for the Canadian user meeting higher standards than generally accepted elsewhere. This has rendered the Canadian designed and manufactured equipment too expensive to compete in export markets.
2. Decisions made by DOC concerning a short term policy to restrict granting of microwave frequencies to prospective users. This policy, which emerged rather than having been announced with warning and an indication of the period of duration, has been unsettling for the manufacturing industry.



### Appendix III

Background paper prepared by DOC on consultation with industry in the implementation of standards

It should be recognized that the radio spectrum is a non-consumable natural resource which must be judiciously regulated and equitably allocated in order to provide the greatest possible benefit to Canada. Unfortunately, radio waves do not respect national borders and due cognizance of this factor must be given in any plan to regulate the spectrum. Since 1935, the management of the radio spectrum had been a responsibility of the Minister of Transport, exercised pursuant to the authority delegated to him under the Radio Act. In 1968 this responsibility devolved upon the Postmaster General (now the Minister of Communications) with the transfer to him of the powers, duties and functions of the Minister of Transport under the Radio Act.

The radio spectrum starts at 10 kHz and extends upwards to the frequency of light and even higher. Of course, as one goes higher in frequency the techniques change and the bandwidth available for modulation increases. In the case of laser communications systems the bandwidth available is capable of carrying extremely large amounts of information. It thus becomes apparent that one of the first steps in proper spectrum management is to study the needs of the various radio services such as maritime-mobile, broadcasting, radio-navigation, fixed point-to-point, satellite, etc. and to allocate the most suitable frequencies for each. The next step is to ensure that each radio station uses no more spectrum than the absolute minimum required to achieve reliable communications. To achieve this objective it is essential that suitable standards be developed which must be met by all radio users. Based on this philosophy a standards program was introduced in 1954 by DOT, and the results to date indicate beyond question the benefits accruing from this program. The Department recognized early that two types of regulatory standards were necessary to adequately control the use of the spectrum:

- (a) equipment (black box) standards
- (b) operating standards.

Since chaos is generally seen as an unhappy state of affairs, most people involved in radio communications have recognized the necessity of regulating radio traffic on the air just as most people recognize the need for regulating vehicular traffic on the highways. Accepting this, one is faced with the problem of developing standards which are reasonable and commensurate with the state of the art at the time they are issued. Consequently, if standards are to be fair and equitable then those who are to be regulated by them should have an opportunity for direct involvement in the development of such standards. Recognizing this, the Department in 1944 called a meeting in Ottawa to which many people from industry and



government were invited. The result of this meeting was the formation of an advisory body called the Canadian Radio Technical Planning Board. The objective of the Board is "to advise the Government concerning the development and regulation of radio services in Canada. Such advice shall be in the public interest and shall be based on consideration of both technical and economic factors."

Membership in the CRTPB is entirely voluntary and consists not of individuals but of non-profit associations, societies, and organizations representing users and manufacturers of telecommunications and users and manufacturers of telecommunications and allied equipment, and of certain engineering and educational societies and associations. These are the sponsor organizations and each sponsor appoints a main representative and an alternate to the Board. The work of the Board is financed from dues received from the sponsor and a grant from D.O.C.

Over the years the CRTPB has proved to be an extremely valuable and effective organ in providing sound advice and recommendations on a variety of technical problems faced by the Department during the past 25 years. Manufacturers are represented on the CRTPB through the Electronic Industries Association of Canada and play a vital role by their active participation in the various CRTPB technical committees. Earlier in its history the Board usually managed to achieve unanimous agreement in its technical committees which were involved in developing suitable recommendations for the Department. However, in recent years, due to more knowledgeable and vocal representation on the part of user organizations it became increasingly difficult to achieve unanimity, so that today recommendations from the Board generally contain two or more minority or dissenting viewpoints. Naturally, the Department would like to receive a unanimous viewpoint from industry but realizes the extreme difficulty in achieving such a position.

For the purpose of comparison, it might be worth looking for a moment to our U.S. neighbours. The Federal Communications Commission, DOC's administrative counterpart, receives comments from Industry by means of carefully regulated rule-making procedures. Whenever a new or modified regulation is desired the proposal is printed in the official government publication, the Federal Register, along with a deadline for receiving comments. In the ensuing months the F.C.C. may receive a large number of written comments from companies, organizations and individuals; in fact they are often inundated. Now this democratic procedure ensured that all comments will be considered and will receive equal weight. In theory this approach seems commendable, in practice it often means that the F.C.C. is saddled with the gargantuan task of reading and sorting out the multitudinous briefs submitted and then making a compromise decision based on many and often divergent viewpoints.

Considering the relatively small size of the Canadian bureaucracy, DOC believes that the Canadian system provides a

more workable administrative arrangement, even though perhaps less democratic in practice. It should be pointed out however, that even though DOC puts much more weight on recommendations received from the CRTPB it is prepared to receive representations from any company, organization or individual. For example, the Department regularly receives briefs or special submissions from the Telephone Association, Railway Association, Electronic Industries Association, West Coast Telecommunication Council, Canadian Petroleum Association, and many others,

When DOC receives recommendations from the CRTPB it generally adopts them (about 80 per cent of the recommendations received are accepted); however, there are times when a conflict with DOC Policy or international agreements arises and in such cases, the Department must adopt an alternate solution, but this has not created any serious problems in the DOC-CRTPB relationship. In general, the relationship has been a rewarding and happy one although there have been moments of disagreements in the past. It should perhaps be mentioned here that the Department has always participated in the work of the CRTPB's technical committees with the status of "observer". Originally, our observers were there to monitor the work of the committee and feed in information as requested, such as Departmental policy, international regulations, statistics, etc. but in recent years the role has changed to a more active one, with the DOC representatives now involved as deeply as any of the regular members. This change has produced a much more fruitful and useful role in the view of both the Department and the Board and one finds that the objectives of both organizations are now more compatible.

Of course, there are inevitable negative aspects to this consultative procedure, the most serious one being the protraction in the promulgation of technical standards issued by the Department. The CRTPB has set out in its by-laws a requirement that all sponsors have at least 60 days in which to return a ballot when voting on any issue or recommendation. Therefore, DOC accepts a minimum two month delay before any formal submission can be forwarded to DOC from the Board. The Department recognizes the need for this democratic procedure. On the other hand, there are wide differences in the way the various chairmen of the technical committees operate. Most meetings of the technical committees are one day affairs and some chairmen are very conscientious and work long hours, often well into the evening hours and some even hold two day meetings, back-to-back. Again some chairmen call only a few meetings each year while others meet as regularly as once a month. It thus becomes obvious that some committees will produce more work in a shorter period of time. Many organizations feel that they cannot permit their key technical people to participate more than once a month due to commitments at home but it seems that lately they have become more aware of the absolute necessity to protect their long-range interests by allowing and even encouraging greater participation. Because of this singular importance of the attitude of the chairman to the work output of the committee it

is of paramount importance that he be a strong leader, dedicated and unbiased, who will put Canada's present and future welfare ahead of those of his own organization; this can be a most demanding role for anyone who accepts a committee chairmanship, but is essential if the Board is to maintain and build upon the hard-won recognition it now holds with Government and Industry. It is the Department's belief that this is one area in which CRTPB work could be speedup i.e. by the Board placing strong pressure on the committee chairman to accept a more responsible attitude in getting their work pushed through.

A question that is often asked is this: "Just how representative is the CRTPB of all the interests in the radio field in Canada?" There is no question of the broad nature of its sponsor interest if one takes the time to examine the list of participating organizations. It is to the credit of the Board that it is continually striving to broaden its sponsorship but it has met considerable difficulty in some areas in the past such as:

- (1) taxicab operators,
- (2) aircraft operators,
- (3) importers of radio equipment.

Generally speaking, the Department is happy with its relationship to industry via the CRTPB and greatly appreciates the conscientious effort and hard work put in by its executive and many of its sponsors and technical committees. Perhaps now would be an opportune time to review the present situation to determine whether the present liaison could be strengthened or streamlined. Alternatively, other methods of liaison might be considered to complement the work of the CRTPB.



## Appendix IV

## International Telecommunication Union

(I.T.U.)

## Introduction:

The International Telecommunication Union is the oldest of the international organizations having been established in Paris in 1865. At the time it was the International Telegraph Union and radio communication did not enter the picture until 1903, when a preliminary radio meeting was held in Berlin, followed by the first radio conference also in Berlin in 1906, when the first "Radio Telegraph Convention" was drawn up and the first Radio Regulations established. From these early beginnings the ITU has come to what it is today; a Union of 137 member countries with its permanent Headquarters located at Geneva, Switzerland.

The aims of the Union are to maintain and extend international co-operation for the improvement and rational use of telecommunications of all kinds; to promote the development of technical facilities and their most efficient operation with a view to improving the efficiency of telecommunication services, increasing their usefulness and making them, so far as possible, generally available to the public. To these ends the Union:

- a) effects the allocation of the radio frequency spectrum;
- b) co-ordinates efforts to eliminate harmful interference;
- c) fosters collaboration among its members for the establishment of rates at levels as low as possible;
- d) assists in the creation, development and improvement of telecommunication equipment and networks in new and developing countries;
- e) promotes the adoption for measures of ensuring the safety of life through the co-operation of telecommunication services;
- f) undertakes studies, makes regulations; adopts resolutions, recommendations and opinions, collects and publishes information concerning telecommunication matters for the benefit of the members.

## Background

### The Convention:

The basic instrument of the International Telecommunication Union is the Convention completed by the following sets of Administrative Regulations:

Telegraph Regulations  
Telephone Regulations  
Radio Regulations  
Additional Radio Regulations.

### Plenipotentiary Conference:

The supreme authority of the Union is the Plenipotentiary Conference which is held approximately every five years, its main responsibility being to revise the Convention, determine the general policies for fulfilling the purposes of the Union described above, review budgetary matters concerning the operation of the Union, approve the accounts of the Union, elect the Secretary-General, Deputy Secretary-General, elect the members of the Union who are going to serve on the Administrative Council, revise if necessary agreements between the Union and other international organizations, deal with such other telecommunication questions as may be necessary and set the date and place of the next Plenipotentiary Conference.

### Administrative Conferences:

In addition to the Plenipotentiary Conference, Administrative Conferences composed of World Administrative or Regional Administrative Conferences are held to consider specific telecommunications matters, i.e. matters dealing with the space, aeronautical mobile, maritime mobile, fixed broadcasting, radio determination and other terrestrial radio, telegraph and telephone services.

The main function of these Administrative Conferences is to amend the Regulations relative to the subject or subjects being considered by the Conference. The discussions at these conferences are mainly of a technical or administrative nature; however, where new regulations are adopted which involve the implementation of new standards and techniques, the economic impact must also be considered.



### Administrative Council:

As mentioned above under the responsibility of the Plenipotentiary Conference and Administrative Council, consisting of 29 members of the Union, is elected to act, on behalf of the Plenipotentiary Council in the interval between such conferences. The Administrative Council meets at least once a year in Geneva and in brief is responsible for the co-ordination of the work of the Union and supervising the administrative functions of the Union. It reviews and approves the annual budget, arranges for the convening of plenipotentiary and administrative conferences and in general acts for the plenipotentiary conference. The discussions at these meetings are mainly of an administrative and financial nature; however, technical matters are involved especially where the approval of the agenda for Administrative Conferences is concerned.

### Permanent Organs of the Union:

There are four permanent organs within the Union:

a) A General Secretariat carries out the everyday operation of the Union under the direction of a Secretary-General who is responsible to the Administrative Council for all the Administrative Council for all the Administrative and Financial aspects of the Union's activities. A Deputy Secretary-General assists the Secretary-General and is responsible to him.

b) The International Frequency Registration Board (IFRB) consisting of five elected members chosen from the candidates sponsored by member countries of the Union. The purpose of this Board is to effect an orderly recording of frequency assignments made by the different countries and to furnish advice to members with a view to the operation of the maximum practicable number of radio channels in those portions of the spectrum where harmful interference may occur.

c) The International Radio Consultative Committee (CCIR) is a technical committee established to study technical and operating questions relating specifically to radio communication and to issue recommendations on them.

d) The International Telegraph and Telephone Consultative Committee (CCITT) is a technical committee established to study technical, operating and tariff questions relating to telegraphy and telephony and to issue recommendations on them.

More detailed descriptions of the organization and work of the CCIR and CCITT is given elsewhere in this brief.

### Preparatory Work for Conferences:

Under Section 5 of the Radio Act the responsibility for International negotiations respecting telecommunication matters lies with the Department of Communications. Therefore in preparing for ITU conferences and Meetings the International Telecommunications Branch initiates and coordinates the efforts of all concerned.

Well in advance of a conference a committee or working group is formed to co-ordinate the Canadian input. Problems are defined, recommendations are drafted, and input to the conference in the form of working papers containing Canadian proposals, is prepared for approval by the Deputy Minister in keeping with overall Canadian policy.

This preparatory work is extensive and detailed, and requires considerable research and study in depth to ensure the best possible presentation of our requirements by the Canadian delegations to these conferences.

The preparatory work for the CCIR and CCITT committees is covered in greater depth elsewhere in this brief.

### Comments and Observations:

The first measures to govern radio communication having International scope were embodied in the "Radio Telegraphic Convention" drawn up at Berlin in 1906 and which was adhered to by the Dominion Government in 1907. A revised International Radiotelegraph Convention was signed by Canada at London in 1912. Again with a view to consolidating international control of the various types of communication services the International Telecommunications Convention of Madrid 1932 was drawn up and regulations governing all classes of communications were annexed thereto. It was at this time that the International Telegraph Union founded in Paris in 1865 had its title changed to the present "International Telecommunication Union".

Canada was among the countries that signed the Madrid Convention of 1932 insofar as it concerns ITU Radio Communication Regulations. It was not until 1937 that Canada signed acceptance of the Telegraph Regulations. Canada has not yet signed the Telephone Regulations, since in the opinion of the telephone industry in Canada the regulations are too detailed in nature and therefore too restrictive to be in the best interests of telephone communication in Canada.

In 1947 major changes in the ITU Radio Regulations and a revision to its Convention was effected by a Conference in Atlantic City. Every area of these Regulations was expanded in particular the provisions relating to Frequency allocations. This Conference also created a new International Frequency Registration Board (IFRB) which is responsible for controlling the use of the radio spectrum throughout the world. The

Administrative Council of the ITU was also created by the 1947 Conference. It supervises the Administrative functions and coordinates the activities of the ITU. Canada has been a member of the Council since its inception. ITU Conferences for the purpose of revising its Convention and the Regulations annexed thereto have been held in 1948-51-52-59-63-64-65-66 and 1967. These Conferences have played a significant role in the improvement of telecommunications throughout the world and in particular for aeronautical and maritime purposes, space radio communications and radio astronomy.

Canada's contribution and participation in the conference associated with the ITU have won an appreciated and respected place in the field of international communications. Canadian representation to these conferences has always been a high standard and the smaller countries of the world have looked to Canada for guidance and leadership as is evidenced by Canada being elected to serve on the Administrative Council since its beginning in 1947. Representatives from Canada have always been in demand to serve not only as committee chairmen at conferences but also as chairmen of the conferences themselves.

This enviable position has been of considerable benefit in permitting Canadian views and aims in radio spectrum management and other areas of telecommunications, to influence the decisions and recommendations of conferences thereby setting the climate where the spectrum space, so necessary for the development of communications in Canada was readily available and the Canadian telecommunications industry was not penalized by restrictive or demanding regulations which are not in the best interests of Canada.

#### Conclusions and Recommendations:

If Canada's influence and growth in the field of international and national communications is to continue and, communications are vital to the growth and prosperity of any country, then our participation in all phases of the ITU endeavour must continue to advance. Only in this way can we continue to play a leading role in the development of international telecommunications.



## Appendix V

### International Radio Consultative Committee (CCIR)

#### Introduction

The International Radio Consultative Committee (CCIR) was established in 1927 at the Washington Radio Conference. It is one of the four permanent organs of the International Telecommunications Union (ITU). Its duties are: to study technical and operating questions relating specifically to radio communications and to issue recommendations on them. Annex I gives definitions of symbols and expressions used in the present brief.

#### Background

All member countries of the ITU, recognized private operating agencies and scientific or industrial organizations can participate in the work of the CCIR.

The CCIR studies technical telecommunication subjects or "Questions" referred to it by:

- the Plenipotentiary Conference of the ITU;
- Administrative Conferences;
- the Administrative Council;
- the International Telegraph and Telephone Consultative Committee (CCITT);
- the International Frequency Registration Board (IFRB);

in addition to those decided upon by its Plenary Assembly (every three years) or, in the interval between Plenary Assemblies, approved by correspondence by at least 20 Members and Associate Members of the ITU.

The Plenary Assembly normally meets every three years and draws up a list of the above Questions, the study of which would lead to improvements in international radio communications. These Questions are then entrusted to a number of Study Groups, composed of experts from different countries. The Study Groups normally hold an interim meeting approximately 15 months after the Plenary Assembly and a Final meeting approximately four months before the next Plenary. The Study Groups develop Study Programmes, prepare reports and draw up Recommendations which are submitted to the next Plenary Assembly. If the Assembly adopts these Recommendations, they are published. The Study Group may also establish International Working Parties for the study of specialized Questions.

There are presently 14 Study Groups, 23 International Working Parties and one Joint CCIR/CCITT Study Group administered by the CCIR; Annex II gives the breakdown of these Groups and the



nature of the Canadian involvement. They are studying 137 Questions, and carrying out 113 Study Programmes. The last Plenary Assembly (Oslo, 1966) ratified 237 reports and 171 Recommendations which have since been published. The next Plenary Assembly (New Delhi, 1970) will be asked to adopt:

- 22 new Questions;
- 23 new Study Programmes;
- 58 new Reports;
- 13 new Recommendations;
- amendments to 42 existing Questions;
- amendments to 41 existing Study Programmes;
- amendments to 135 existing Reports;
- amendments to 63 existing Recommendations;

plus all additions and amendments which were proposed at the final meetings of the Study Groups in September-October, 1969. A total of approximately 750 documents were prepared at these final meetings but lack of time and staff prevented us from analysing their full impact on the next Plenary Assembly in time for the present submission.

In addition, the CCIR is participating in one Joint CCIT/CCIR Special Study Group, five World Plan Committees and two Joint Special Autonomous Working Parties, all administered by the CCITT.

The discussion at the meetings is mainly technical and the Recommendations have an important influence on the activities of telecommunications engineers and technicians, operating administrations and companies, manufacturers and designers of equipment throughout the world. Particular attention also is paid to the study of questions and the formulation of recommendations directly connected with the establishment, development and improvement of telecommunications in new or developing countries in both the regional and international fields.

The Canadian input into the CCIR is provided via the Canadian National Organization for CCIR (CNO/CCIRO which is composed of Study Groups subdivided into Working Parties, using the same model as the CCIR. The Working Parties-which are composed of representatives from government departments, Crown Corporations, manufacturers and common carriers-prepare the first draft of the Canadian documents. These draft documents are then submitted to the Study Groups concerned. They are then submitted to an Executive Committee of the CNO/CCIR for further approval. Finally, the Canadian documents are submitted to the Senior Committee of the DOC for final approval before furtherance to Geneva.

The Executive Committee of the CNO/CCIR was established in February 1968 to bring together senior engineering and management representatives from government departments and industry to organize Canadian CCIR activity. These representatives are expected to have the authority necessary to

assign people, time and other resources to this work and to approve the results. This Committee is chaired by DOC. A list of present members and their positions is given in Annex III.

#### Comments and Observations

Canada started to participate, initially mainly as an observer, at Warsaw, 1956 (two delegates) and Los Angeles, 1959 (3 delegates). Our role then started to increase considerably when we became aware of the need to protect our interests. This became very apparent at the 1962 Interim Study Group IV (Space Communications) meeting in Washington and even more so at the Xth Plenary Assembly in Geneva, 1963. The wide range of subjects required a total attendance of 19 engineers and technical officers from government departments, Crown Corporations, manufacturers and common carriers. The attendance at Oslo, 1966, was 27. Annex IV gives a list of the names and affiliations of the Canadian delegates at the final meetings of the Study Groups in Geneva, 1969. The value of the CCIR has been well recognized by other organizations outside the Government and over the years many of them have asked to participate in its work, e.g. the Telephone Association of Canada, Canadian Overseas Telecommunications Corporation, National Research Council, Canadian Broadcasting Corporation, Northern Electric Co., Electronic Industries Association of Canada, RCA Limited, Lenkurt Electric, etc.

Through extensive pre-Conference meetings, either in full body or in small Working Parties, a good understanding is developed by all delegates of the Canadian needs and our best approach in achieving them. To achieve this uniformity of view of all the different entities and interests within Canada has required a strong but neutral hand on the part of the Government.

At the international meetings, the Canadian delegation has shown excellent teamwork, and has been able to speak with a single voice presenting coordinated viewpoints in the different engineering committees. The extensive preparatory work greatly enhances the effectiveness of our participation.

One of the principles on which our participation is based is two-fold: (a) to generate a climate of understanding and co-operation; and, (b) to present, competently, well thought out proposals and solutions. The former is intended to predispose others in our favour while the latter creates confidence in Canadian technical talent, technology and products.

It is well noted that new and developing countries are seeking advice from those Administrations who exhibit leadership and engineering competence at CCIR conferences. As an example of our demonstrated competence in the field of satellite communications the ITU Secretary-General invited Canada (amongst only a few nations) for a meeting 14-16 January 1970 at ITU Headquarters, to assist in the analysis and preparation of a report on the comparative economic aspects of various satellite

broadcasting systems. As another example our presentation at the CCIR and discussions with other delegates have led to enquiries with Canadian industries as possible suppliers for the satellite TV broadcasting plan embarked upon by the Indian Government.

A proof of the demonstrated Canadian leadership and competence at CCIR conferences is given in Annex V which lists the chairmanships and secretary positions held by Canadian delegates at the final meetings of the Study Groups in Geneva, 1969. In assessing the relative importance of these chairmanships it should be noted that:

- a working group is a subdivision of a study group
- a sub group is a subdivision of a working group
- a sub group is a subdivision of a sub subgroup

Annex VI gives a list of the terms of reference of various groups.

The main benefits to Canada which accrue from our participation in the CCIR are:

- a direct voice in the spectrum utilization within assigned communication bands as well as an indirect voice in influencing changes to Radio Regulations pertaining to radio spectrum usage through the advisory role played by the CCIR at Radio Conferences.
- a direct voice in the development of preferred technical characteristics for radio systems to be used in fixed and mobile applications, broadcasting, monitoring, navigational aids, radio paging, communications satellites, radio relays, etc.
- the securing of interference protection for our exceptionally large national telecommunications investments.
- the development of technical standards which will enhance the marketability of Canadian equipment.
- the demonstration of Canada's competence and leadership in the field of radiocommunications, which will assist Canadian industries in their drive to increase their exports to other countries.

## Conclusions and Recommendations

Our degree of involvement should continue to increase selectivity where Canadian interests are involved. Specifically, DOC should seriously consider a more active participation in Study Groups III (Fixed Service Systems), X (Sound Broadcasting), XI (Television) and CMTT (CCIR/CCITT Joint Commission for Television Transmission).

In other Study Groups, at the moment, the most urgent "Questions" to study are:



- technical factors governing the optimal use of the geo-stationary orbit;
- feasibility of frequency sharing between space and terrestrial services;
- direct television braodcasting from satellites;

The study of the above Questions will require continued participation by DOC, CBC, COTC, TAC, RAC, EIAC, RCA Ltd. and N.E. Co.



## Annex I

## Abbreviations and Definitions of Activities

## Definitions

BTI	International Telecommunications Branch
BTR	Telecommunications Regulations Branch
CAB	Canadian Association of Broadcasters
CAE	Canadian Aviation Electronics
CBC	Canadian Broadcasting Corporation
CCIR	International Radio Consultative Committee
CCITT	International Telegraph and Telephone Consultative Committee
CMIT	Joint CCIR/CCITT Commission for Television Transmission
COTC	Canadian Overseas Telecommunications Corporation
CNO/CCIR	Canadian National Organization of the International Radio Consultative Committee
CRC	Communications Research Centre
DND	Department of National Defence
DOC	Department of Communications
DOT	Department of Transport
EIAC	Electronic Industries Association of Canada
EMR	Department of Energy, Mines and Resources
IFRB	International Frequency Registration Board
NE Co.	Northern Electric
NRC	National Research Council
RAC	Railway Association of Canada
RCA Ltd.	Radio Corporation of America (Canada) Ltd.
TAC	Telephone Association of Canada

UTC

Coordinated Universal Time

## Annex I

## Definitions

## Monitoring

This activity involves:

- attendance at conferences as an observer;
- examination of the documents received from other Administrations or the Secretariat of the International Radio Consultative Committee;
- assessment of the above documents, in consultation with the Canadian entities concerned, to find out whether any of these Draft proposals, Study Programmes, Questions and, especially, Draft Recommendations affect Canadian interests and require action.

## Active

This activity involves:

- preparation of Canadian documents and related studies;
- attendance at conferences as active participant;
- monitoring, as defined in the present Annex.

## Semi-active

This activity means that in previous Plenary periods we participated actively but that in the present Plenary period we restricted our involvement to monitoring only - e.g., Study Groups III and XIV.

## MHz

Megahertz: one million cycles per second

## kHz

Kilohertz: one thousand cycles per second

## CCIR Organization's Operation

## A. Study Groups

Study Group		Canadian Involvement *	
No.	Name	Unit	Comments
I	Transmitters	BTI/BTR	Monitoring only
II	Receivers	BTI/BTR	Monitoring only
III	Fixed service systems	BTI/BTR	Semi-active
IV	Space systems and radio-astronomy	BTI	Active
		BTR	Active
		CRC	Active
		DND	Active
		CBC	Monitoring only
		TAC	Active
		RAC	Active
		RCA	Active
		N.E.	Active
		EIAC	Active
V	Propagation over the surface of the earth and through the non-ionized regions of the atmosphere	BTI	Monitoring only
		CRC	Active
		N.E.	Active
		EIAC	Active

\* See Annex I for list of abbreviations and explanation of comments



Study Group		Canadian Involvement *	
No.	Name	Unit	Comments
VI	Ionospheric propagation	BTI	Monitoring only
		CRC	Active
		EIAC	Active
		CBC	Active
VII	Standard frequencies and time- signals	BTI	Monitoring only
		NRC	Active
		CAE	Active
		EMR	Active
VIII	International monitoring	BTI	
IX	Radio-relay systems	BTI	Active
		BTR	Active
		CBC	Active
		RCA	Active
		N.E.	Active
		TAC	Active
		EIAC	Active
		RAC	Active
X	Sound Broad- casting	BTI	Active
		CBC	Active
		RCA	Active
		CAB	Active

\* See Annex I for list of abbreviations and explanation of comments.

Study Group		Canadian Involvement *	
No.	Name	Unit	Comments
XI	Television	BTI	Active
		CBC	Active
		CAB	Active
		TAC	Active
		RCA	Active
XII	Tropical	BTI	Monitoring only
	broad-		
	casting		
XIII	Mobile	BTI	Active
		BTR	Active
		DOT	Active
		DND	Active
		TAC	Active
		EIAC	Active
		RAC	Active
XIV	Vocabulary	BTI	Semi-active
CMTT	CCIR/CCITT	BTI	Active
	Joint	BTR	Active
	Commission	CBC	Active
	for television	TAC	Active
	transmissions	RAC	Active
		CAB	Active
		N.E.	Active

\* See Annex I for list of abbreviations and explanation of comments

## B. International Working Parties

Working Party		Canadian Involvement *	
No.	Name	Unit	Comments
I.1	Classification and designation of emissions	BTI	Monitoring only
I/2	Radio interference	BTI	Monitoring only
II/1	Typical receivers	BTI	Monitoring only
III/1	Improved efficiency in the use of the radio frequency spectrum	BTI	Monitoring only
IV/1	Technical factors affecting the efficient use of the geostationary satellite orbit	BTI	Active
V/1	Tropospheric propagation data for broadcasting, space and point-to-point communications	BTI	Monitoring only

\* See Annex I for list of abbreviations and explanation of comments

Working Party		Canadian Involvement*		Future Meetings	
No.	Name	Unit	Comments	Name	Date
V/2	Influence of the non-ionized regions of the atmosphere on wave propagation	BTI	Monitoring only		
VI/1	Sky-wave field strength and transmission loss at frequencies between the approximate limits of 1.5 and 40 MHz	BTI	Monitoring only		
VI/2	Revision of atmospheric radio noise data	BTI	Monitoring only		
VI/3	Basic long-term ionospheric predictions	BTI CRC	Monitoring only Active		
VI/4	Sky-wave propagation for frequencies between 150 and 1500 kHz	BTI	Monitoring only		

\* See Annex I for list of abbreviations and explanation of comments



Working Party No.	Name	Canadian Involvement*	
		Unit	Comments
VI/5	Sky-wave propagation at frequencies below 150 kHz	BTI	Monitoring only
		CRC	
VI/6	Fading of signals propagated by the ionosphere	BTI	Monitoring only
VI/7	Short-term predictions of operational parameters for ionospheric radio communications	BTI	Monitoring only
		CRC	Active
VI/8	VHF Propagation by Sporadic E	BTI	Monitoring only
VII/1	UTC system	BTI	Monitoring only
		NRC	Active
VII/2	Forms of expression of all kinds and the conditions of their use in the standard frequency and time signal service	BTI	Monitoring only
IX/1	Hourly mean noise objective	BTI	Monitoring only
		TAC	Active

\* See Annex I for list of abbreviations and explanation of comments

Working Party		Canadian Involvement*	
No.	Name	Unit	Comments
X/1	Determination of the subjective loudness of a broadcasting programme	BTI	Monitoring only
XII/1	Tropical broadcasting	BTI	Monitoring only
XIV/1	Terms and definitions	BTI	Monitoring only
XIV/2	Terms relative to reliability	BTI	Monitoring only
PLEN/1	Reorganization of the work of the CCIR	BTI	Active

\*See Annex I for list of abbreviations and explanation of comments

## CNO/CCIR Executive Committee Representatives

Organizations	Representatives	Addresses
Canadian Association of Broadcasters (CAB)	Mr. W.A. Caton	Technical Consultant, C.A.B., 85 Sparks St., Box 627, Stn. B., Ottawa, Ontario
Canadian Broadcasting Corporation (CBC)	Mr. R.D. Cahoon	Vice-President, Engineering Canadian Broad- casting Corp., P.O. Box 478, Terminal "A", Ottawa 2, Ont.
Canadian Overseas Telecommunications Corporation (COTC)	Mr. D.V. Doran- Veevers	Executive Assistant to Vice-President, Engineering and Operations, Canadian Overseas Telecommunications Corporation, 625 Belmont Street, Montreal 101, P.Q.
Department of Defence (DND)	Mr. J.R. Eaton	Director of Communi- cations Systems Engineering, Canadian Forces Headquarters, Department of National Defence, Ottawa 4, Ontario.  Attn: J.R. Eaton (DCSE 2-2).
Electronic Industries Association of Canada (EIAC)	Mr. D.V. Carroll	President, TMC Canada Ltd., R.R. #5, Ottawa, Ontario.
Montreal Engineering Company Limited	Mr. N. Rivington	Manager, High Voltage Transmission and Communications Division, Montreal Engineering Company Limited, P.O. Box 250, Place d'Arnes, Montreal 1, P.Q.

Northern Electric Limited (N.E.)	Mr. A. Curran	Manager, Systems Studies, Northern Electric Company Limited, P.O. Box 3511, Station "c", Ottawa, Ontario.
Railway Association of Canada (RAC)	Mr. G.R. Groome	Senior Radio Engineer, Telecommunications Dept., Canadian Pacific Railway Company, Place du Canada, Montreal 3, P.Q.
Radio Corporation of America Ltd., (RCA)	Mr. J.G. Leshy	Manager, Communi- cations Systems, RCA Limited, 1001 Lenoir St., Montreal 30, P.Q.
The Telephone Association of Canada (TAC)	Mr. J.L. Wilson	Chairman, Technical Committees, The Telephone Association of Canada, 1050 Beaver Hall Hill, Montreal, P.Q.
Department of Communi- cations (DOC)	Mr. W.J. Wilson	Director, Telecommunications Regulation Branch, Telecommunications Bureau, Berger Building, 100 Metcalfe St., Ottawa 4, Ontario.
Department of Communi- cations	Mr. J.R. Marchand (Chairman)	Director, International Tele- communications Branch, Berger Building, 100 Metcalfe St., Ottawa 4, Ontario.



Department of Communi- Mr. F.G. Perrin  
cations (Secretary)

Chief,  
International  
Arrangements  
Division,  
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Berger Building,  
100 Metcalfe Street,  
Ottawa 4, Ontario.

Names and Affiliations of the  
Canadian Delegates at the Final Meeting of the  
CCIR Study Groups in Geneva, 1969

Head of delegation

A.G.W. Timmers	Department of Communications, International Telecommuni- cations Branch, Berger Building, 100 Metcalfe Street, Ottawa 4, Ontario.
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Deputy head of delegation

W.A.C. Schultz	Department of Communications International Telecommuni- cations Branch, Berger Building, 100 Metcalfe Street, Ottawa 4, Ontario.
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Delegates

E.R. Allan	The Telephone Association of Canada, 1050 Beaver Hall Hill, Montreal, P.Q.
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F. Banks	Northern Electric Laboratories, Department 8332, P.O. Box 3511, Station C, Ottawa, Ontario.
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B.C. Bleviss	Department of Communications, Communications Research Centre, Shirley Bay, Ottawa, Ontario.
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G.C. Brooks	Department of Communications Telecommunications Regulations Branch, Berger Building, 100 Metcalfe Street, Ottawa 4, Ontario.
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J.J. Brownlee	Canadian Overseas Telecommuni- cations Corporation, 625 Belmont Street, Montreal, P.Q.
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G. Courtemanche	Department of Communications, International Tele- communications Branch, Berger Building, 100 Metcalfe Street, Ottawa 4, Ontario.
A. Curran	Northern Electric Co. Ltd., P.O. Box 3511, Station C, Ottawa, Ontario.
B. Duke	Canadian Broadcasting Corporation, 7925 Cote Saint Luc Road, Montreal 29, P.Q.
R.C. Eldridge	The Telephone Association of Canada, 1050 Beaver Hall Hill, Montreal, P.Q.
I. Godier	Northern Electric Co. Ltd., P.O. Box 3511, Station C, Ottawa, Ontario.
L.C. Goody	The Telephone Association of Canada, 1050 Beaver Hall Hill, Montreal, P.Q.
H.F. Hannay	Northern Electric Co. Ltd., P.O. Box 3511, Station C, Ottawa, Ontario.
J.T. Henderson	National Research Council, Applied Physics Division, Ottawa 7, Ontario.
P. Hervieux	The Telephone Association of Canada, 1050 Beaver Hall Hill, Montreal, P.Q.
J.A. Jarvis	Northern Electric Co. Ltd., P.O. Box 3511, Station C, Ottawa, Ontario.
D. Jung	RCA Victor Co. Ltd., Space Systems Division, 1001 Lenoir Street, W., Montreal, P.Q.

C. Lemieux	The Telephone Association of Canada, 1050 Beaver Hall Hill, Montreal, P.Q.
B.W. Cosman	The Telephone Association of Canada, 1050 Beaver Hall Hill, Montreal, P.Q.
J. Nyles	Department of Transport, Telecommunications and Electronics Branch, Ottawa 4, Ontario.
L. Petrie	Department of Communications, Communications Research Centre, Shirley Bay, Ottawa 2, Ontario.
A. Rechota	The Railway Association of Canada, 151 Front Street, W., Toronto, Ontario.
E.B. Porvell	Department of Transport, Telecommunications and Electronics Branch, Ottawa 4, Ontario.
C.A. Siocos	Canadian Broadcasting Corporation, 7925 Cote Saint Luc Road, Montreal 29, P.Q.
J.C. Tremblay	The Telephone Association of Canada, 1050 Beaver Hall Hill, Montreal, P.Q.
G. Tutt	Department of Communications, Telecommunications Regulations Branch, Berger Building, 100 Metcalfe Street, Ottawa 4, Ontario.
H. Van Allan	The Telephone Association of Canada, 1050 Beaver Hall Hill, Montreal, P.Q.
J.L. Wilson	The Telephone Association of Canada, 1050 Beaver Hall Hill, Montreal, P.Q.



Chairmanship held by Canadian delegates

Affiliation	Name Chairman	Secretary	Working Group	Sub Group	Sub Sub Group
Department of Communications	A.G.W. Timmers	G.C. Brooks	IX-D		
	W.A.C. Shultz	J. Myles	IV-D		
	G. Courtemanche		XIII-E		IV-A-1-c
	G.C. Brooks			IX-D-5	
	G. Tutt			XIII-A-(1)**	
	B.C. Blevins			IV-A-2	
Department of Transport	L. Petrie		VI-E		
	E.B. Powell				
	J. Myles			IV-D-3	IV-D-4-(1)
Telephone Association of Canada	R.C. Eldridge				
	L.C. Goody			XIII-C-4 and XIII-C-5	
	C. Lemieux			CMTT-A-2	
Canadian Broadcasting Corporation	C.A. Siocos			XIII-B-3	
				XI-E-2	
					IV-A-4-a
RCA Ltd.	D. Jung				
Northern Electric Co.	F.M. Banks	A. Piechota		IV-B-1	
	I. Godier			IX-A-2	
	A. Burran	H.F. Hannay	CMTT-A		

\* See Annex VI for the terms of reference of the various groups.

\*\* No specific symbol was assigned to these groups.

## Annex VI

## Terms of reference of various groups

Symbol	Terms of reference
IV-A-1-c	To correct Tables in draft Report L.3.a(IV) on the feasibility of sound and television broadcasting from satellites.
IV-A-2	Choice of frequencies, orbits and systems.
IV-A-4-a	To amend draft Report L.2m(IV) on the use of pre-emphasis in frequency-modulation systems.
IV-8-1	Coordination procedures and mechanics of interference characteristics.
IV-D	Communication and radio determination satellite services for aircraft and ships.
IV-D-3	Communication satellite systems for aircraft and ships.
IV-D-4-- (1)	To study the human/machine interface problem of a radio communication satellite service for aircraft and ships.
VI-E	Basic observations and long-term predictions for ionospheric mapping.
IX-A-2	Radio-relay systems for the transmission of pulse-code modulation and other types of digital signals.
IX-D	Radio-relay systems characteristics.
IX-D-5	To amend draft Report E.5.d(IX) on preferred characteristics for the simultaneous transmission of television and a maximum of four sound channels.
XI-E-2	Recommended characteristics for collective and individual antenna systems for domestic reception of signals from terrestrial transmitters.
XIII-A-- (1)	To expand an existing Question and draft a new Report on the preferred technical characteristics of single-sideband equipment.
XIII-B-3	To draft a new Report on radio-paging systems.
XIII-C-4	To draft a new Recommendation for the preferred characteristics of systems using linked compressor and expander techniques.

- XIIII-C-5      To draft a new Study Programme to study in more detail the actual performance of a "lincompex" system.
- XIIII-E      Operational requirements for maritime and aeronautical services using satellite techniques.
- CMTT-A      Television transmission standards.
- CMTT-A-2      To revise Parts 1 and 5 of draft Report E.5.t(CMTT) on the transmission characteristics of television circuits intended for use in international connections.

## Appendix VI

## International Telegraph and Telephone

## Consultative Committee (CCITT)

## 1. Description

The International Telegraph and Telephone Consultative Committee (CCITT) is one of four which are permanent organs of the International Telecommunication Union.

## 2. Duties

The duties of the CCITT are assigned in Article 14 of the ITU Convention as follows:

"to study technical, operating and tariff questions relating to telegraphy and telephony and to issue recommendations on them".

Under Article 4 of its Convention, the ITU will "foster collaboration among its Members and Associate Members with a view to the establishment of rates at levels as low as possible consistent with an efficient service and taking into account the necessity for maintaining independent financial administration of telecommunication on a sound basis". The CCITT is the organ which studies such questions and issues Recommendations as circumstances indicate.

The first purpose of the Union is "to maintain and extend international co-operation for the improvement and rational use of telecommunications of all kinds". CCITT Recommendations used world-wide are up-dated every four years, in French and English, then Spanish, Russian and Chinese as required. There are now nine volumes containing 4,000 pages, supplemented by several volumes of "Instructions", "Directives" and "Studies of Interest at the National Level", prepared in response to special questions.

## 3. Structure and Procedures of the CCITT

The structure of the CCITT is given in Article 14 (ITU Montreux 1965), supplemented by Resolution 1 (CCITT Geneva 1956) as modified at each subsequent Plenary Assembly (P.A.) Countries which are members of the ITU participate in the CCITT as a matter of right. For the purpose of voting, a delegate claiming to represent a country must be supported by an appropriate governmental communication to the Director of the CCITT. Private operating agencies with the approval of their member country may participate in the Study Group and P.A. meetings. CCITT procedures include:

- a) Plenary Assembly every four years, next due at Geneva in 1972.



- b) Study Groups specified at each P.A. and assigned specific questions.
- c) a Director elected at a P.A. for a term normally two plenary periods in duration.
- d) the small specialized secretariat.
- e) a small laboratory at ITU headquarters, Geneva, continuing work started in Paris by the old CCIF for the standardization of telephone set measurement techniques peculiar to telephony.

#### 4. Plenary Assembly

- a) The ITU Convention states that the CCITT shall work through the medium of a Plenary Assembly, normally meeting every three years, but eight months before any World Administrative T. and T. Conference, and meet under the Rules of Procedure annexed to the Convention with working arrangements as specified in the ITU General Regulations:
- b) At its first P.A. (Geneva 1956) the CCITT set up "Additional Rules of Procedure" amplifying the General Regulations in so far as the CCITT is concerned. This accommodated the amalgamation of the CCITT and CCIF which was done there.
- c) CCITT Resolution No. 1 carefully sets forth the duty and authority of the P.A. concerning the questions to be adopted for study, the method of study, and the approval of CCITT REcommendations. It also specifies duties of elements of the P.A. and meeting formalities. It is up-dated at each P.A.
- d) The Fourth Plenary met 14 to 25 October, 1968, at Mar del Plata: 72 members of the ITU and 15 international organizations were represented by 309 delegates and observers. Final meetings of Study Groups were held 23 September to 11 October at the same location, as is the custom of CCITT. These make the total up to 602 delegates; 26 recognized private operating agencies and 36 scientific/industrial organizations are included.

#### 5. Study Groups and Working Parties

- a) There are now 16 regular study groups each with a Chairman and Vice-Chairman elected at Plenary and each with a list of questions assigned by the

Fourth P.A. for which replies must be given at the Fifth P.A. Particulars are given in Appendix B.

- b) There are three Special Study Groups, each of which deals with an emerging technique - computer communications, pulse code modulation and the theoretical study of transmission noise.
- c) There are 14 Joint Working Parties, each of which has been assigned one or more related questions each concerning several of the above study groups. JWP's are disbanded when they have replied to their questions. The existence of a JWP prevents questions of interests to several study groups shuttling back and forth without achieving definitive replies. That is why their number was sharply increased at the last P.A.
- d) There are three "Autonomous Working Parties". Each will report back to the next plenary with a handbook suitable for use in developing national telecommunications. System economics and financial planning are active subjects at present.
- e) There are five Plan Committees - World, Africa, Latin America, Asia and Europe, (joint CCITT/CCIR administered by the CCITT). These have been meeting on a four-year cycle. This gives a total of 33 CCITT study entities set up at P.A. plus eight more where the CCITT has responsibility which is shared with the CCIR. In addition, there is a CCIR/CCITT Television Transmission study group where the CCIR is the managing authority. This gives a large total of 42.
- f) Some of the Study Groups set up their own sub-groups, in order to accomplish timely completion of their work. Exploding activity in a new technique occasionally results in one of these becoming a new Study Group at the next Plenary, as was the case with pulse coding and time division techniques in the 1964 to 1968 period. In that case the P.A. makes every effort to suppress an existing study group, and did so in 1968.

#### 6. Study Group Contributions, Meetings and Results:

- a) Questions having been selected, approved and assigned by the P.A. to the groups it has authorized, the first step in the study process is the preparation of national contributions which are distributed by the CCITT Secretariat without delay in French and English, and sometimes Spanish. In the period 1964 to 1968, 2015 contributions were received, reproduced, translated and distributed to

8000 Study Group members. There are over 300 questions under study now - compared with some 250 then. At least 2500 contributions are expected between 1968 and 1972.

- b) The last P.A. had only enough time to outline some points of the 1968-1972 meeting schedule, leaving it to the Chairmen and Director to establish the final program, part of which is given at Annex A. It depends on the amount of money for CCITT meetings which the ITU Administrative Council authorizes annually in May, and on the number of contributions received for study by different groups. It took 1107 group meeting days in 1964 to 1968 to discuss some 250 questions on which 2015 contributions were received. An increase of 20 per cent is foreseen for 1968-1972. More over-lap of meeting dates will be one consequence. This strains the secretariat, which is not increasing, the translation service at meetings, budget of the ITU, and the time and travel program of participating national members, but every effort is being made to refuse questions which do not require study and to eliminate meetings not essential for timely replies to approved questions.
- c) As for the replies to the questions, although reported to the Plenary for approval, they are not published in printed volumes. It is the CCITT Recommendations which are published. Amendments or new Recommendations are drafted by study groups as replies to questions are reached. A new set is published for sale after each Plenary, the volumes being translated and printed according to demand and given a colour code. 1968 P.A. will issue a 10-volume "White Book".

## 7. Director, CCITT

- a) The Director of the Consultative Committee coordinates the work of the Plenary Assembly and study groups and is responsible for the organization of the work of the Consultative Committee and its documents, according to Chapter 17 of the ITU General Regulations. He chooses members for his small specialized secretariat but the ITU Director General has the final decision. He prepares an annual estimate of CCITT expenses for the approval of the Administrative Council and makes a CCITT activities report to that body on that occasion.
- b) The manner of election of the Director is given in paragraph 196 of the Convention. In 1964/65 there was some thought that the elected Directors of the



two CCI's should become appointed officials of the ITU Secretariat like the Director of Technical Cooperation and the Director of Administration. But ITU Montreux 1965 confirmed that the ITU Secretary General and his Deputy, the Director of the CCIR and the CCITT must all be elected and this done from different countries with appropriate representation of the geographic regions of the world.

- c) At Montreux in 1965 the ITU extended the mandate of the present Director (see Resolution No. 2) beyond his normal retirement age which was reached in 1967. Mr. J. Rouviere has been the only Director thus far in the CCITT. Mr. Besseyre, who received 18 votes against Rouviere's 25 at the original Plenary, has been the senior staff member. Mr. Besseyre, formerly a professor in Paris, was an international staff employee, heading the old CCIT, and Mr. Rouviere appeared as head of delegation and Director General of Telecommunications of France in 1956. Mr. Besseyre will retire on pension at the end of 1969 and Mr. Rouviere at the 1972 Plenary.

#### 8. Canadian Participation - General

- a) concerning studies and Recommendations in the CCITT program, expectations vary from one Canadian company to another. The TAC,\* with its huge investment to be protected and its sensitivity to government controls, has a great interest in participating, especially in areas of new technology. COTC, which began under Commonwealth system standards, interfaces with more non-Commonwealth CCITT countries every year. In the bilateral negotiations required for establishing these new services, CCITT Recommendations are a standard reference for tariffs, operating and technical standards. Public telegrams are relayed without the electrical connection required for telephone calls, but the automation of the relaying process by COTC gives rise to increasing interest from CN and CP. (They must also interface with Western Union which has different standards from CCITT and with each other.) And the Northern Electric Company export program now includes customers who specify equipment meeting CCITT Recommendations. And when telephone service by satellite circuit is studied, we must remember Telesat Canada, whether or not it elects to be recognized as an operating agency as is COMSAT in the USA delegation to the CCITT.



- b) Now there is a new service and a new market - data communications. Companies are competitive and have opposing interests in the new data services CCITT study groups such as "Special A - Data Transmission" and "NRD - World Data Network". There are no Canadian telephone or data regulations. Services requiring filed tariffs - and even Telex is not one of these yet - will of course be regulated financially as by the Canadian Transport Commission. What is ahead in operating and technical regulatory policy is a matter for the Department of Communications.
- c) In signing the Convention at Madrid in 1932 where the ITU took its present form, Canada had to adhere to one of the following:

Telegraph Regulations  
Telephone Regulations  
Radio Regulations.

It selected the last. Then, in 1937, Canada adhered to the Telegraph Regulations annexed to that Convention, and consequently began participating in the Administrative Telegraph and Telephone Conferences, which deal with amendments to the Regulations, and also the CCIT, which issued Telegraph Recommendations. The Telephone Regulations, at the request of Canadian telephone industry, remain unsigned by Canada. There was never any Canadian participation in the CCIF, except for an industry observer. Neither the Telegraph Act which, apart from its paragraphs on construction and operation of marine cables and overland telegraph lines, is very general, nor the Provisions Governing Telegraphs and Telephones of the Railway Act (para 380 to 383) make reference to the ITU, but as Canada adheres to the ITU Telegraph Regulations, they are referred to by the industry as occasion requires. On the other hand the Radio Regulations of Canada require all radio stations to observe the ITU Convention (Radio Regs, Part I, para 7). The participation of the Canadian government as a signatory member of the ITU is therefore seen somewhat differently by the operating industry with respect to the CCITT and the CCIR. Nor are Telegraph and Telephone Recommendations seen in the same light, for additional reasons given below.

- d) Until after World War II, Canada, like many developing nations today, did not have a native international system. The first transatlantic telegraph cable was being laid as the Fathers of Confederation met in Charlottetown. Their interest

is reflected by the clarity with which federal responsibility for telegraph and other communications between provinces is stated in the BNA Act. (Telephones had not been invented in 1867). From just after Confederation until 1960, there was a Government Telegraph and Telephone Service at locations where commercial service was not yet available. Canadian Government participation as a non-operator in the study and approval of International Telegraph Regulations and Telegraph Recommendations has as its primary object protection of the interests of the Canadian public and Canadian companies operating services, namely TAC, COTC and RAC.\* As for manufacturing, Canada is an importer of telegraph apparatus rather than an exporter. Telegraph standardization is seen from this viewpoint, but telephone equipment standardization is of great importance now due to the success of Canadian exports.

- e) Canadian interest in the old CCIF was academic. High frequency radio transatlantic telephone circuits had carried a small volume of traffic under conditions which did not give rise to standardization problems. But the 36 wired circuits of good quality connecting Montreal and London changed that in 1956, just when the CCITT was formed. The Telephone Association of Canada, though not an operating entity, (the Trans-Canada Telephone System is the revenue sharing and service planning body) participated in the CCITT as a Recognized Operating Agency with the agreement of the Canadian government per paragraph 193 of the ITU Convention. In 1963 the COTC sought and obtained this arrangement to clarify its position in debates. Until then it had participated as representing the Government of Canada. International relationships are similar to those for telegraph service, plus the following factors:
1. Canada has reserved signature on the Telephone Regulations, annexed to the ITU Convention for reasons given in 2.
  2. A.T.&T. practices and standards are used in the Trans-Canada Telephone System through a service agreement administered by Bell Canada. U.S.A.-Canada direct distance dialling was introduced years ago. Telephone service to the Canadian public has reached standards not

enjoyed in other countries, in spite of the fact that large areas of Canada are served by companies with provincial charters (three of these are provincial government enterprises), and some of the public telephones are provided by Canadian National.

3. The COTC has operator service for Telegraph and Telex but not for telephone, which is Bell Canada at Montreal and B.C. Telephones (General Tel) at Vancouver, the same as other long distance telephone service whether to USA where the bulk of the external traffic goes, or overseas.
  4. Telesat Canada, a domestic telecommunications satellite organization sponsored by the Government of Canada has as one of its objects the transmission of telephone traffic. Routing and transmission problems associated with COTC Intelsat facilities will then be more complex.
- f) The Canadian delegation at the 1968 Fourth Plenary of the CCITT numbered 21, of which four were from the Department of Transport/Communications, and 17 from operating and manufacturing organizations. Their names, study group interests and affiliation are given in Annex C.
  - g) CCITT Study Groups, I, II and III, which have to do with tariffs met in Montreal, June/July 1970, in response to an invitation offered by TAC through the Head of Delegation at Mar del Plata and supported by other operating agencies, COTC and the Railway Association. These operating agencies jointly provided the financial outlay for accommodation, local staff and supplies, and a local co-ordinating committee was formed, which included Mr. D.S. Robertson of the Department of Communications who is international Vice-Chairman of one of the groups - S.G. III, Tariff Principles.
  - h) The amount of Canadian participation is steadily rising, whether measured in contributions, new questions put to study, days spent at meetings abroad, meeting days sponsored in Canada, or Canadian-inspired texts published in CCITT Books. The importance of CCITT conclusions to the operating agencies and manufacturers is evident from their growing participation.



## 9. Canadian Contributions to Study Program

As authors of recent CCITT contributions, we may note Italcable; K.D.D. Japan; IBM France; Siemens and Halske, Germany; Mr. E.C. Laird, (A Vice President of A.T.&T. writing as a Group Chairman), as well as TAC and COTC of Canada. The last Government of Canada contributions COM SP A/No. 47, January 1963 - "180 - 200 Baud Telegraph Switching Service for Data Transmission" appears in the 1964 Books of Recommendations as a Supplement. In the 1964-1968 program of studies, the greatest number of contributions from Canada were submitted by TAC and COTC. (In the CCITT, under its Additional Rules of Procedure, the Administrations, the recognized private operating agencies, the scientific/industrial organizations registered with a study group or working party, or individual Chairmen mail their contributions, comments, results of experiments and proposals "designed to further the studies to which they relate" to the Director of the CCITT). The study program (300 questions) and the meeting schedule (300 meeting days per year) are examined by Canadian organizations and the International Branch, Department of Communications for points of interest. Each Canadian organization has to register by mail to the Director, CCITT, at Geneva in each study group for which it wishes to receive documentation. Canadian organizations have selected the pattern indicated in Annex C. DOC registers in all the study groups and sub-groups where it expects to follow the details closely and maintain an active program to ensure co-ordination of all Canadian documentary contributions and meeting attendance. Participation by government representatives is recommended where there would be worthwhile benefit, but not necessarily in sub-groups where only commercial men and systems engineers active in current operating or manufacturing can make constructive contributions. The ITU General Regulations state that, in principle, the consultative studies are to be by correspondence, with meetings only when oral discussion is required to resolve replies as budget permits. In an effort to reach agreement at a meeting, the Chairman of an International Study Group occasionally desires to know the opinion of a Country, in order to anticipate the result of a vote at Plenary.

## 10. Canadian Voting in the CCITT

The Department of Communications, representing the Government of Canada, as a party to the ITU Convention, sends a representative to head the Canadian delegation to the CCITT Plenary and exercise Canada's vote. When the issue concerns the study program or the Recommendations, Canada's vote reflects industry and government telecommunications policy. If political aspects arise, policy advice from the Department of External Affairs is applied. There is a provision which Canada has never used, and no other country uses now, whereby in the absence of a representative of the Member (government) and by authorization of the Minister of Communications for each particular case, the representatives of the Canadian recognized operating agencies as a whole and regardless of their number could exercise Canada's



one Plenary vote. In the General Regulations of the ITU and the Additional Regulations of the CCITT, there is no provision for any kind of vote at the Study Group meetings. They are only authorized for oral discussion of written contributions. Their replies are taken as unanimous, unless anyone opts out on the record. But the CCITT Plenary "one vote per Member (of the ITU)" is carefully defined, as is the alternative of a correspondence vote of Members (of the ITU). Since October 1968, Provisional CCITT Recommendations may be published on unanimous agreement of the study group concerned, but formal concurrence of Members of the Union must first be given by correspondence. If such a Provisional CCITT Recommendation is sought by a study group, the Department of Communications would be asked, under ITU correspondence procedures, to register Canada's vote. Canadian recognized private operating agency members of the study group would expect to be consulted, and advised which way Canada voted. Final approval must remain the prerogative of the next CCITT Plenary Assembly.

#### 11. Department of Communications Responsibility

The responsibility of the Canadian Department of Communications in the ITU, where it co-ordinates international telecommunications relationships, including consultation with the Department of External Affairs when the United Nations or another U.N. Agency is concerned, and takes seat on the Admin. Council when Canada is elected (as at present), is simple and direct, as is its part in the Administrative Telegraph and Telephone Conferences including the Telegraph and Telephone Regulations annexed to the Convention. In the CCITT Plenary Assembly, it exercises the vote of Canada. It also extends the formal recognition required by Canadian agencies desiring membership in the CCITT, and authorizes their participation under terms and conditions of Canadian telecommunications policy. But the study program of the CCITT is by definition a consultative process in which the best expertise available for the work participates directly in the framing of Recommendations on engineering, operating and tariff matters so broadly conceived and so technically correct in detail that their worldwide acceptance will be without question if the Plenary Assembly chooses to formally adopt and publish them. By analogy with the Additional Procedures of the CCITT, domestic co-ordination of Canadian contributions is by correspondence, meetings being held whenever oral discussion is required to resolve matters of national interest and obligations, and always before the final study group meetings which traditionally occur at CCITT Plenary Assemblies. At these more formal Canadian discussions concerted actions are agreed which will best result in Plenary documents as far as possible reflecting the interests of the Canadian public and industry. This simplifies the exercise of Canada's formal CCITT vote.

#### 12. Telecommunications Planning Co-ordination and Regulation by other than CCITT

The European Postal Union Communications Committee (CEPT) finds it necessary to have an active data transmission group, and even to invite representatives of operating companies in USA and Canada for clarification of transatlantic revenue and routing on telegrams and telephone traffic. The need for regional co-ordination of telegraph and telephone problems is steadily rising. As the global network grows, it depends less on New York, London and Paris. The Latin American long distance network is being planned under CITELECOM, part of OAS, and its members meet apart from the CCITT. The Economic Commission for Africa and the Organization for African Unity have established the first international circuit in a pilot plan to improve regional communications there. In Asia another group is awaiting approval under the U.N. Development program to improve regional communications. Besides these, there are major international operating organizations unrecognized by the CCITT, operating entirely outside it and setting their own standards. The largest of these is INTELSAT, with its sixty-odd members of the ITU participating but no co-relation of operating, tariff or technical standards with the CCITT, except indirectly through the membership of COMSAT and, of course, the INTELSAT members who are also CCITT members. (The Director General of the ITU has invited INTELSAT to become an international Recognized Private Operating Agency). Mexico has chosen not to be integrated within the A.T.&T. network as in Canada. But in adhering to the CCITT Recommendations for telephone networks, the Latin American group at Mar del Plata insisted on and obtained CCITT recognition of a "Regional" status for the signalling system they intend to use, which was not till then recognized by the CCITT. Also affecting Canada is the Commonwealth Telecommunications Council serving 655 million people in 23 countries "for the mutual exploitation on a common user basis of the Commonwealth network of cable and radio facilities which link these countries together and to non-Commonwealth countries, ensuring efficient usage and continuing benefits through charges for services substantially lower than those paid in other countries". (GPO press release, 27 March 1969).

### 13. Related Standards Activity in Canada and Abroad

Traditionally the working methods of the CCITT have been updated as required in order that CCITT Recommendations will be compatible with other standards activities. Manufacturers work through the International Standards Organization (ISO) and the International Electrotechnical Commission (IEC). The Canadian Standards Association (CSA) works with these, as it does with the United States of America Standards Institute (USASI). The Institute of Electrical and Electronics Engineers (IEEE), New York, also has committees active in standardization work. The CSA-USASI standardization has not been linked in Canada with the CCITT study program but CCITT and ISO have been represented at each others meetings at the international level. In particular, a representative of ISO now attends all the study sessions of the CCITT dealing with data transmission. The electrical interface between computers and telecommunications lines is an example of



continuing standardization studies. There has now been success in achieving an agreed CCITT-ISO alphabet for data transmission similar to the American Computing Society (ASCII) code. In addition to keeping ISO standards and CCITT Recommendations in line in this equipment area, this closer ISO-CCITT link at the study level has been useful as a channel for exchanging views on data system requirements for the future as between manufacturer of computers and supplier of telecommunications services and equipments.

## C. Observations:

### 1. Value of CCITT Results

The CCITT study program is well established. CCITT Recommendations have wide acceptance and will soon replace much of the Tel and Tel Regulations annexed to the Convention. Other standards and practices affect Canada too.

### 2. Trend of Work

The volume of work is increasing by about 25 per cent each plenary period due to expansion of the global network, new rates and economics studies, automation of operations and the introduction of satellite circuits, computer communications and other new technology. Sometimes CCITT facilities are swamped.

### 3. Organization, Program and Budget

The CCITT Plenary Assembly is now so big (73 countries, 300 participants) and has such a formidable study program to deal with that it cannot meet more frequently than once in four years, and when it does it cannot perform effective organization planning beyond modifying the most obvious areas needing immediate attention. Although it has the poser to do so (ITU 1965, para 781), it does not set a recommended annual budget for the CCITT. An organizational study was proposed at Mar del Plata.

### 4. Secretariat

The specialized secretariat serving CCITT is static in size and starting to suffer from retirements due to age. In particular, the Director, on whom most of the programming and all of the budgeting now depends, will retire in 1972. Funds for the secretariat are allocated by the ITU Administrative Council yearly.

### 5. Canadian Participation

Canadian participation is steadily rising. Annex C indicates study group interest last year. As systems, equipment, operating and maintenance problems, revenue and economics, telegraph and telephone all have more or less separate study groups, the division of attendance has been fairly obvious

between TAC, RAC, COTC and the Northern Electric Company. Data communications and satellite circuits are, however, of increasing interest to all. Canadian government and industry participation has been continuous since CCITT 1st Plenary (Geneva 1956), 2nd (New Delhi 1960), 3rd (Geneva 1964), and 4th (Mar del Plata). Geneva 1972 is next. All original participants are retired, and several others since.

#### E. Conclusions:

1. At its 1972 Plenary Assembly the CCITT will approve new Recommendations of interest to Canada. Some examples are:

- a) Further definition of objectives for communications satellite telephone circuit transmission planning, routing and switching.
- b) New networks for world-wide data communications.
- c) Technology for integrated digital networks including pulse code modulation, and time division switching.
- d) Automation of operations and charging.
- e) System economics, regional tariff principles, and the proportion of the national economy appropriate for communications investments.
- f) Conversion of Telegraph and Telephone Regulations.

The Department of Communications, as well as Canadian Recognized Private Operating Agencies, will be making strong and well-coordinated efforts to provide Canadian contributions and participate in the most vital meetings of the varied and continuous study program.

2. In 1972 the CCITT will elect a new Director and consider important recommendations from a task force to be authorized by the ITU Admin Council to study CCITT functions and procedures appropriate for the 1970's and 1980's. Other World Telecommunications Plan meetings, like those in the past, will bring up new problems for the CCITT.

3. The ITU may be operating under a somewhat different charter after its 1971 ITU Plenipotentiary, with one likely result being to decrease the amount of work carried out by the Administrative Telegraph and Telephone Conferences, through increasing the responsibilities of the CCITT concerning Recommendations for replacing many of the Regulations.



Annex A

International Telegraph and Telephone  
Consultative Committee  
(C.C.I.T.T.)

2 rue de Varembe  
Geneve 20  
Switzerland  
Telephone:

34 80 00

Telegram: COMTEL

Period 1968/1962

Date: 25 March

1969

C.C.I.T.T. Circular No. 18

C4

To: Administrations of the Member  
of the Union

Recognized private operating  
agencies taking part in the  
work of the C.C.I.T.T. of the  
C.C.I.T.T.

International organizations in  
liaison with the C.C.I.T.T.  
(List D)

Subject: C.C.I.T.T. meetings in the 4th quarter of 1969 and in  
1970

Dear Sir,

- A. I have pleasure in forwarding below: 1) the programme of C.C.I.T.T. meetings planned for the end of 1969 which have not so far been the subject of official announcement and, 2) a preliminary draft programme of meetings planned for 1970. This draft programme is not official and is being sent for information only; it will depend on the credits granted by the Administrative Council for C.C.I.T.T. meetings in 1970 and on the progress of the work of the various C.C.I.T.T. Study Groups.

## 1. Programme for the end of 1969

(This programme does not include the meetings which have already been officially announced in C.C.I.T.T. circulars).

<u>Nature of the meeting</u>	<u>Meeting-place</u>	<u>Dates</u>
Special Study Group C	Geneva	2 September-5 September 1969
Working Party IV/3	Geneva	22 September-26 September 1969
Working Party IV/4	Geneva	29 September-3 October 1969
Special Study Group D	Paris (or Geneva)	27 October-7 November 1969
Working Parties of Study Group II	Geneva	10 November-12 December 1969

## 2. Preliminary draft programme of meetings for 1970

<u>Nature of the meeting</u>	<u>Probable meeting-place</u>	<u>Dates envisaged</u>
Working Parties of Study Group XIII, and Study Group XIII	Geneva	12 January-4 February 1970
Study Group XI	Geneva	5 February-18 February 1970
Study Group V, Study Group VI, and their Working Parties	Geneva	18 days in January/February 1970
Study Group XII, Study Group XVI	Melbourne	16 February-13 March 1970
Joint LTC Working Party	Geneva	1 April-7 April 1970
Study Group XV	Geneva	8 April-21 April 1970
Working Parties IV/5 and IV/2	Geneva	9 days in April
CAS 5	Geneva	April 1970
Plan Committee for Asia and Oceania and TAS Working Party	Teheran	20 April-3 May 1970
Study Group IV	Geneva	8 days in May or June 1970
PAR Working Party	Geneva	5 days in June 1970
Study Group I	Montreal	8 June-19 June 1970
Study Group II	Montreal	8 June-19 June 1970
Study Group III	Montreal	22 June-30 June 1970
CAS 3	Geneva	June
Working Party IV/3	Geneva	4 days in September 1970
Working Party II/3?	Geneva	September 1970
Working Parties of Study Group XI	Geneva	September/October 1970
Working Parties of Study Group XV	Geneva	3 or 4 weeks in autumn 1970
Plan Committee for Europe	Warsaw	October 1970

and the Mediterranean and TEUR Working Party	(or Geneva)	
TER Working Party	Geneva	5 days in November 1970
Joint ALP Working Party	Geneva	5 days in autumn 1970
Joint MAT Working Party	Geneva	3 days in autumn 1970
Joint TGX Working Party	Geneva	5 days in autumn 1970
Study Group X	Geneva	5 days in autumn 1970
Working Parties of Study Group IX, and Study Group IX	Geneva	8 days in autumn 1970
Study Group VIII	Geneva	3 days in autumn 1970
Joint NDN Working Party	Geneva	5 days in autumn 1970
Working Parties of Special Study Group A	Geneva	8 days in autumn 1970
Special Study Group A	Geneva	10 days in autumn 1970
Working Parties of Study Group XIV	Geneva	6 days in autumn 1970

B. I would take this opportunity to ask those Administrations, operating agencies, industrial organizations and international organizations which have not yet replied to my Circular No. 6 i.e. which have not yet submitted the names of their participants in Study Groups, Joint Working Parties and Special Autonomous Working Parties for the period 1968/72 to do so without delay. The rate at which contributions are being sent out is now picking up very rapidly and it will not be possible to deliver those which have already been despatched to participants whose names are received late. Registrations for the period 1964/1968 which are not renewed for the period 1968/1972 will shortly be cancelled.

Yours faithfully,

J. ROUVIERE  
Director of the C.C.I.T.T.



## LIST A

## LIST OF STUDY GROUPS AND PLAN COMMITTEES

Abbreviations used in document reference numbers		Title	Chairman	Vice-Chairman
COM I	Study Group I	Telegraph operation and tariffs (including telex).	Mr. A. GOMES (United States)	Mr. S. PARAMOR (United Kingdom)
COM II	"	Telephone operation and tariffs.	Mr. R. RUTSCHI (Switzerland)	Mr. N. BIEZENI (Netherlands)
COM III	"	General tariff principles; lease of telecommunication circuits.	Mr. L. BURTZ (France)	Mr. D. ROBERTSON (Canada)
COM IV	"	Transmission maintenance of international lines, circuits and chains of circuits.	Mr. J. VALLOTON (Switzerland)	Mr. J. KILL (Denmark)
COM V	"	Protection against dangers and disturbances of electro-magnetic origin.	Mr. H. RIEDEL (F.R. of Germany)	Mr. G. GRATTA (Italy)
COM VI	"	Protection and specifications of cable sheaths and posts.	Mr. WALTERS (United Kingdom)	Mr. A. BLANCHI (France)
COM VII	"	Definitions and symbols	Mr. DUCOMMUN (Switzerland)	
COM VIII	"	Telegraph equipment and local connecting	Mr. G. BAGGENSTOS (Switzerland)	Mr. I. SAVITZKY (Ukraine)
COM IX	"	Telegraph transmission quality; specification of equipment and rules for the maintenance of telegraph channels.	Mr. R. BROWN (Australia)	Mr. B. KUBIN (Czechoslovakia)
COM X	"	Telegraph switching	Mr. A. JANSEN (Netherlands)	Mr. D. FAUGERAS (France)

Abbreviations used in document reference numbers		Title	Chairman	Vice-Chairman
COM XI	Study Group XI	Telephone switching and signalling	Mr. A. JOUTY (France)	Mr. TCHOUTA MOUSSA (Cameroon)
COM XII	"	Telephone transmission performance and local telephone networks.	Mr. F. KROUTL (Czechoslovakia)	Mr. M.F.T. ANDREWS (United States)
COM XIII	"	Automatic and semi-automatic telephone networks	Mr. A. NEWSTEAD (Australia)	Mr. S. KUHN (POLAND)
COM XIV	"	Facsimile telegraph transmission and equipment.	Mr. H. BITTER (F.R. of Germany)	Mr. WINOGRADOW (Poland)
COM XV	"	Transmission systems.	Mr. F. JOB (France)	Mr. D. GAGLIARDI (Italy)
COM XVI	"	Telephone circuits	Mr. J. BILLEN (United Kingdom)	Mr. SERRURE (Belgium)
COM Sp. A	" "Special A	Data transmission	Mr. J. RHODES (United Kingdom)	Mr. V.N. VAUGHAN (United States)
COM Sp. C	" "Special C	Noise. (Joint C.C.I.R./C.C.I.T.T. Study Group, administered by the C.C.I.T.T.)	Mr. R. KAISER (F.R. of Germany)	Mr. MATSUMOTO (Japan) *)
COM Sp. D	" "Special D	Pulse code modulation.	Mr. R. BOYD (United States)	Mr. G. BAUDRIN (Belgium)

\*) Provisional appointment pending the next C.C.I.R. Plenary Assembly.

Abbrev. used in doc. ref. Nos.	Title	Chairman	Vice-Chairman
C.M.T.T.	Joint Study Group on television transmission	Mr. ANGEL (France)	Mr. W. SIMPSON (United Kingdom)
PLAN	World Plan Committee	Mr. BIGI (Italy)	Mr. O.H. MOHAMED (Pakistan)*
PLAN AFRICA	Africa Plan Committee	Mr. L. DIA (Senegal)	Mr. I. GIRMAY (Ethiopia)*
PLAN LAT. AM.	Latin America Plan Committee	Mr. A.C. NUNEZ (Mexico)	Mr. R. SEVERINI (Argentina)*
PLAN ASIA	Plan Committee for Asia and Oceania	Mr. A. ZAIDAN (Saudi Arabia)	Mr. S. FUJIKI (Japan)*
PLAN EUROPE	Plan Committee for Europe and the Mediterranean Basin	Mr. T. NOAT (France)	Mr. H. DIETRICH (Poland)*

\* ) Provisional appointment pending the next C.C.I.R. Plenary Assembly.

Joint Working Parties

Abbrev. used in doc. ref. Nos.	Title	Study Group concerned	Chairman	Vice-Chairman
GM TAF	Tariffs (Africa)	I, II, III	Not yet appointed	Not yet appointed
GM TAL	Tariffs (Latin America)	I, II, III	"	"
GM TAS	Tariffs (Asia)	I, II, III	"	"
GM TEUR	Tariffs (Europe)	I, II, III	"	"
GM ALP	Use of Alphabet No. 5	I, VIII, X, Sp. A	"	"
GM TCX	Worldwide telex and gentex routing plan	I, IX, X	"	"
GM LTG	Use of telephone-type lines for purposes other than telephony	IX, XIV, XV, Sp.A, Sp.C	"	"
GM MAT	Automatic telegraph maintenance	VIII, IX, X	"	"
GM FT6	Field trials of System No. 6	XI, XIII	"	"
GM PFP	Protection of power-feeding systems	V, XV	"	"
GM PAR	Protective devices	V, VI (+CIGRE)	"	"
GM CDF	Protection against lightning	V, VI	"	"
GM TER	Earthing systems	IV, V, VI, XI, XV	"	"
GM NRD	New networks for data transmission	I, IX, X, Sp.A	Mr. OHLMER (F.R. of Germany)	Mr. MAC DONALD (Canada)



List of Special Autonomous Working Parties Set Up  
To Carry Out Background Studies of Interest to the Developing Countries

Abbreviation used in document reference numbers	Title	Chairman	Vice-Chairman
GAS 3	Economic and technical comparison of transmission systems	Mr. AOUD (Morocco)	Mr. G. WALLINSTEIN (United States)
GAS 4	Primary power sources	Mr. F. BENTLEY (Canada)	Mr. M. LINDEN (Sweden)
GAS 5	Economic conditions and telecommunication development	Mr. H. LONGQUEUE (France)	Mr. E. GALLI (Argentine Republic)

## Annex C

Canadian Participants at IVth Plenary Assembly  
Mar del Plata, September - October, 1968

## CANADA

J.R. MARCHAND		Sp B, AP
Head of Delegation		
V.C. MACDONALD		Sp A, IX, XII, XVI, XI
Deputy Head of Delegation		XV, Sp B, AP
Delegates		
T. CARSS	TAC	AP
H. CLARKE	CN/RAC	AP
A CURRAN	N.E. Labs	Sp A, XI, XIII, Sp B, AP
F. DARTLEY- BENTLEY	DOT	AP
V. O'HAGAN	COTC	IV, XI, XIII, Sp B
G. PESCU	CP/RAC	AP
D. ROBERTSON	DOC	GAS 5, II, III, I X/I, X, XI, XIII, Sp B, AP
J. WILSON	TAC	AP

## CANADIAN OVERSEAS TELECOMMUNICATION CORPORATION

J. BROWNLEE	Sp A, XII, XVI, XV, IX I, X/I, X, XV, Sp B
M. PERRAS	IX, I, X/I, X, XV, Sp B

## THE RAILWAY ASSOCIATION OF CANADA

L. SWAINE	I
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## THE TELEPHONE ASSOCIATION OF CANADA

A. MACKINNON	IV, XI, XIII
N. MACHFOLGER	Sp A, XII, XVI, XV, Sp B
J. TREMBLAY	Sp A, II, XI, XIII, Sp B, AP

## NORTHERN ELECTRIC COMPANY LIMITED

K.B. SIMONSEN	XIII
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L. STIENSTRA	XI, XIII, XV, Sp B
S. WHITAKER	XII, XVI, IV, VI, V/VI, V
P. WHITTALL	XVI, XV, GAS 3
G. WOOLNOUGH	XV, VI















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